

REMARKS

The Office Action dated June 4, 2002, has been carefully reviewed in light of the Examiner's helpful comments and suggestions.

As a result of the Office Action, a number of objections were raised in connection with the drawings, which have been addressed by the above amendments. Submitted herewith for approval by the Examiner are two drawing sheets with proposed changes in Figures 7-9 shown in red. Moreover, in response to the Examiner's objection to reference numerals "2" and "7a" in Figs. 7-9, Applicant respectfully submits that Figs. 7-9 illustrate different views of the prior art infrared communication device.

Furthermore, a number of objections were raised in connection with the specification, all of which have been addressed by the above amendments.

Claims 1 and 4-7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 5,506,445 to Rosenberg in view of U.S. 5,418,384 to Yamana. Claim 2 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenberg in view of Yamana and further in view of U.S. 4,843,335 to Amano. And claim 3 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenberg in view of Yamana and further in view of JP 07015043 to Fujimura. These references have been carefully reviewed but are not believed to show or suggest Applicant's invention as now claimed. Reconsideration and allowance of the pending claims is therefore respectfully requested in view of the following remarks.

To establish a *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *See* MPEP 2143.03. Amended claim 1 now requires a plurality of infrared rays emitting elements that are mounted on the substrate

and arranged on an X-line, an infrared rays receiving element mounted on the substrate at a position on the X-line, a first lens elongated in a direction of the X-line and provided on the infrared rays emitting elements, and a semispherical second lens provided on the infrared rays receiving element. The first lens has an elongated convex shape and a length longer than a length of the arrangement of the infrared rays emitting elements so as to expand an infrared ray radiation range in the direction of the X-line. Also, the light radiation range of the infrared rays is largely expanded in the X-direction by elongated first lens. Therefore, signals can be widely and accurately transmitted to a receiver. Utilizing a single lens on a plurality of light emitting elements in accordance with the present invention allows the infrared communication device be manufactured in a simple and low cost manner.

Neither Rosenberg nor Yamana, individually or in combination, teach or suggest a single elongated lens provided for a plurality of light emitting elements and for expanding the light radiation range in the X-direction. Therefore, it is respectfully submitted that claim 1 is patentable over the prior art combination.

Yamana discloses a concave reflector metal film 3 for concentrating light rays. Similarly, the lenses disclosed in Amano and Fujimura also concentrate light rays. Claims 5 and 6 are dependent from claim 1 and are therefore allowable for the same reasons as claim 1.

Claims 4 and 7 have been cancelled thereby rendering their obviousness rejections moot.

Claim 2 is dependent from claim 1, and since Amano does not address the shortcomings of the Rosenberg and Yamana combination, it is respectfully submitted that claim 2 is patentable over prior art for the same reasons provided in connection with claim 1.

Claim 3 is dependent from claim 1, and since Fujimura does not address the shortcomings of the Rosenberg and Yamana combination, it is respectfully submitted that claim 3 is patentable over prior art for the same reasons provided in connection with claim 1.

The prior art references made of record by the Examiner have each been considered but are not believed to obviate against the allowability of the claims as amended. It is noted that none of these references have been specifically applied by the Examiner against any of the original claims.

Each issue raised in the Office Action dated June 4, 2002, has been addressed and it is believed that claims 1-3 and 5-6 are in condition for allowance. Wherefore, reconsideration and allowance of these claims is earnestly solicited.

Respectfully submitted,
DENNISON, SCHULTZ &
DOUGHERTY

By: 

Amir H. Behnia
Attorney for Applicant
Reg. No. 50,215
(703) 412-1155 Ext. 16

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LAW OFFICES
DENNISON, SCHULTZ & DOUGHERTY
612 CRYSTAL SQUARE 4
1745 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VIRGINIA 22202-3417

703 412-1155

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IN THE CLAIMS:

1. (Amended) An infrared communication device comprising:

a substrate;

a plurality of infrared rays [light] emitting [element] elements mounted on the substrate and arranged on an X-line;

[a light] an infrared rays receiving element mounted on the substrate at a position on the X-line;

a first lens elongated in a direction of the X-line and provided on the [light] infrared rays emitting [element] elements; and

a semispherical second lens provided on the [light] infrared rays receiving element;

the first lens having an elongated convex shape and a length longer than a length of the arrangement of the infrared rays emitting elements so as to expand infrared rays radiation range in the direction of the X-line.

IN THE SPECIFICATION:

Please replace the paragraph between page 1, line 28 and page 2, line 6, with:

The infrared LED elements and others are covered by a light transmissive resin 7 such as an epoxy resin in which a visible rays [cuting] cutting material is included. The infrared LED elements are covered by resin 7a and the photodiode is covered by resin 7b. Thus, the resin 7 allows the infrared LED and the photodiode to emit and receive the light, and also protects the elements.

Page 3, line 20, please replace the paragraph containing the description of Fig. 3 with:

Fig. 3 shows a radiation pattern in the [Z direction] Y line section;

Page 3, line 21, please replace the paragraph containing the description of Fig. 4 with:

Fig. 4 shows a radiation pattern in the X [direction] line section;

Page 3, line 24, please replace the paragraph containing the description of Fig. 6 with:

Fig. 6 shows a radiation pattern in the X [direction] line section;

Please replace the paragraph between page 4, line 28 and page 5, line 2 with:

As shown in Fig. 3, the radiation pattern D of the infrared rays emitted from the infrared LED elements 11 is [marrow] narrow in the [Z] Y direction.